

REMARKS

Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-20 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the remarks as set forth below.

Entry of Response

Applicant submits that entry of this response and full consideration thereof is proper since only remarks are being submitted. No new issues are being submitted which require consideration and search. Entry of the Amendment is respectfully requested.

Rejection under 35 USC 103

Claims 1-20 stand rejected under 35 USC 103 as being obvious over Takahashi et al. (U.S. Patent No. 5,903,239) in view of Stopperan (U.S. Patent No. 5,719,749). This rejection is respectfully traversed.

The Examiner states the Takahashi et al. shows an integrated module including a transparent substrate 1a having a circuit layer formed on one surface of the substrate and with a circuit and at least two chips which are mounted on the substrate by way of flip-chip bonding. The Examiner admits that Takahashi et al. does not show a circuit substrate which attaches to the transparent substrate. The Examiner relies on Stopperan to show a circuit substrate 40 which attaches to the transparent substrate and at least includes a circuit layer. The Examiner feels it would have been obvious to make a circuit substrate attached to the transparent substrate of Takahashi et al.

Applicant disagrees with the Examiner's statement of the Takahashi et al. reference. The Examiner has pointed out the substrate 1a and referred to the circuit layer on which the chips are placed. The Examiner is apparently referring to the microstrip lines 4 and 8 to which the chips 52 and 54 are mounted. However, applicants disagree that this circuit layer is formed on the transparent substrate. It is clear that substrate 1a is covered by a ground conductor film 2a. Such a film normally covers a large portion of these surfaces of the substrate in order to prevent

interference. In addition, a dielectric film 3a covers the ground conductor film 2a and the substrate to insulate the chips from the ground conductor film 2a. Applicant submits that it is impossible to consider the microstrip lines 4 and 8 as being a circuit layer formed directly on one surface of the transparent substrate. These lines are not in contact with the substrate surface and are separated therefrom by the ground conductor film 2a and the dielectric film 3a. Further, the second paragraph of claim 1 states that the two chips are mounted on the transparent substrate. In the reference, the chips cannot be mounted on the substrate since they are separated therefrom by the same ground conductor film 2a and dielectric film 3a. Further, if a circuit substrate is added to Takahashi et al., as suggested by the Examiner, it would also not contact the surface of the substrate since it would also be separated therefrom by the same ground conductor film and dielectric film.

In the Examiner's response to arguments regarding claim 1, the Examiner states that Takahashi et al. teaches "element 2a layer is formed directly on the surface of the transparent". While the ground conductor film 2a is formed on top of the substrate 1a, this ground conductor layer does not form a circuit layer. First, ground conductors cannot include circuitry since the conductors are grounded and prevent the circuit elements from operating properly. Further, the chips are not mounted on this film, but instead are mounted on the microstrip lines which are separated from the ground conductor by the dielectric film. Accordingly, Applicant submits that the ground conductor film 2a cannot be considered to be the circuit layer as suggested by the Examiner. If the Examiner persists in this rejection, he is requested to point out how a grounded conductor can be a circuit layer and also how the chips 52 and 54 are mounted on the ground conductor film 2a. For these reasons, applicant submit that the Examiner has misapplied the Takahashi et al. reference and that claim 1 would not be obvious over this reference even if taken in conjunction with Stopperan.

Stopperan shows in Fig. 1 a printed circuit assembly 10 including a printed circuit board 20 with a flexible printed circuit overlay 40 mounted thereon. Thus, the overlay 40 does not attach to a transparent substrate but is instead adhered to the printed circuit board. The base substrate material 22 is not described as being transparent. Accordingly, Applicant submits that

it would not be obvious to one of ordinary skill in the art to attach an overlay 40 to a transparent substrate device since there is no showing of a need to use a transparent device.

Thus, applicants submit that the Examiner is incorrect in stating the claim 1 is obvious over the combination of these two references. Neither reference shows a circuit layer formed directly on one surface of the transparent substrate with the two chips and circuit substrate attached thereto. Accordingly, Applicant submits that claim 1 is allowable.

Claims 2-12 depend from claim 1 and as such are also considered to be allowable. In addition, each of these claims contains additional limitations which make these claims additionally allowable.

Claim 13 is an independent claim which is similar to claim 1. Claim 13 describes the transparent substrate as having the circuit layer formed directly on one surface of the transparent substrate and having two chips which are connected to bumps formed on the circuit for electrical interconnection. Applicant submits that this claim is also not obvious over the references for the same reason recited above in regard to claim 1. Accordingly, claim 13 is likewise allowable.

Claims 14-20 depend from claim 13 and as such are also considered to be allowable. In addition, these claims recite other features that make them additionally allowable.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied by the Examiner, either alone or in combination. In view of this, reconsideration of the rejection and allowance of all the claims are respectfully requested.

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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